CLAIMS

What is claimed is:

1. A machine-readable indicia-bearing substrate structure, comprising:

a substrate having a first surface and a second surface;

a first information bearing indicia defined by a fluorescent material positioned adjacent to the first surface;

a second information bearing indicia defined by a fluorescent material positioned adjacent to the second surface; and

means for preventing interference between a first fluorescing signal emitted by the first indicia and a second fluorescing signal emitted by the second indicia during a detection process.

2. The substrate structure of Claim 1 wherein the interference preventing means includes a thin metal foil layer positioned between the first indicia and the second indicia.

3. The substrate structure of Claim 1 wherein the interference preventing means includes a reflective or absorptive layer positioned between the first and second indicia.

4. The substrate structure of Claim 3 wherein the reflective or absorptive layer comprises one or more of the following materials:

Titanium (IV) Oxide (TiO2), Zinc Oxide (ZnO), Zirconium (IV) Oxide (ZrO2), aluminum oxide (AlO3), aluminum oxide hydroxide (AlO(OH)), aluminum trihydroxide (Al(OH)3).

5. The substrate structure of Claim 1 wherein the interference preventing means includes a black background disposed between the first and second indicia.

6. The substrate structure of Claim 1 wherein the interference preventing means includes:

a first layer of a reflective or an absorptive material disposed on the first surface of the substrate, the first indicia disposed on an outer surface of the first layer; and

a second layer of a reflective or an absorptive material disposed on the second surface of the substrate, the second indicia disposed on an outer surface of the second layer.

7. The substrate structure of Claim 1 wherein the interference preventing means includes reflective or absorptive radiation blocking materials dispersed within said substrate.

8. The substrate structure of Claim 1 wherein the substrate comprises first and second thin layers of a substrate material, and the interference preventing means includes a reflective or absorptive layer sandwiched between the first thin layer and the second thin layer.

9. The substrate structure of Claim 1 wherein the substrate is selected from the group consisting of:

paper, polyester, polyethylene and polystyrene.

10. The substrate structure of Claim 1 wherein said fluorescent material is a material which fluoresces energy at a wavelength within the spectral region between 200 and 1100 nanometers upon excitation by excitation radiation.

11. The substrate structure of Claim 1 wherein the first indicia and the second indicia are arranged in an overlapping relationship.

12. The substrate structure of Claim 1 further comprising a sheet of a print medium, and said substrate structure is adhered to a surface of the sheet of the print medium.

13. The substrate structure of Claim 1 wherein the substrate is a print medium, and the indicia are applied to a portion of the print medium which does not receive printed components of an image during a printing process.

14. The substrate structure of Claim 1, further comprising a layer of a print medium in roll form, and said substrate structure is attached to a surface of the layer of the print medium.

15. A print medium encoded with information bearing indicia, comprising:

a layer of a print medium;

an indicia-bearing tape structure adhered to said layer of the print medium, said tape structure comprising:

a tape substrate having a first surface and a second surface;

a first information bearing indicia defined by a fluorescent material positioned adjacent the first surface;

a second information bearing indicia defined by a fluorescent material positioned adjacent the second surface; and

means for preventing interference between a first fluorescing signal emitted by the first indicia and a second fluorescing signal emitted by the second indicia during a detection process.

16. The print medium of Claim 15 wherein the interference preventing means includes a thin metal foil layer positioned between the first indicia and the second indicia.

17. The print medium of Claim 15 wherein the interference preventing means includes a reflective or absorptive layer positioned between the first and second indicia.

18. The print medium of Claim 17 wherein the reflective or absorptive layer comprises one or more of the following materials:

Titanium (IV) Oxide (TiO2), Zinc Oxide (ZnO), Zirconium (IV) Oxide (ZrO2), aluminum oxide (AlO3), aluminum oxide hydroxide (AlO(OH)), aluminum trihydroxide (Al(OH)3).

19. The print medium of Claim 15 wherein the interference preventing means includes a black background disposed between the first and second indicia.

20. The print medium of Claim 15 wherein the interference preventing means includes:

a first layer of a reflective or an absorptive material disposed on the first surface of the tape substrate, the first indicia disposed on an outer surface of the first layer; and

a second layer of a reflective or an absorptive material disposed on the second surface of the tape substrate, the second indicia disposed on an outer surface of the second layer.

21. The print medium of Claim 15 wherein the interference preventing means includes reflective or absorptive radiation blocking materials dispersed within the tape substrate.

22. The print medium of Claim 15 wherein the tape substrate comprises first and second thin layers of a tape material, and the interference preventing means includes a reflective or absorptive layer sandwiched between the first thin layer and the second thin layer.

23. The print medium of Claim 15 wherein the tape substrate is fabricated from a material selected from the group consisting of:

paper, polyester, polyethylene and polystyrene.

24. The print medium of Claim 15 wherein said fluorescent material is a material which fluoresces energy at a wavelength within the spectral region between 200 and 1100 nanometers upon excitation by excitation radiation.

25. The print medium of Claim 15 wherein the first indicia and the second indicia are arranged in an overlapping relationship.

26. The print medium of Claim 15 wherein the layer of the print medium is a layer of a transparent or clear print material.

27. The print medium of Claim 15 wherein the layer of the print medium is in sheet form.

28. The print medium of Claim 15 wherein the layer of the print medium is in roll form.

29. A method of reading data encoded on print media, comprising:

providing a layer of a print medium having an indicia-bearing tape structure adhered to a surface of said layer, said tape structure including

a tape substrate having a first surface and a second surface,

a first information bearing indicia defined by a fluorescent material positioned adjacent to the first surface, a second information bearing indicia defined by a fluorescent material positioned adjacent to the second surface; and

means for preventing interference between a first fluorescing signal emitted by the first indicia and a second fluorescing signal emitted by the second indicia during a detection process;

providing an image transfer device having a light source for illuminating the tape structure and a sensor for detecting the radiation emitted by the indicia; and

illuminating the tape structure with the light source and detecting the first fluorescing signal emitted by the first indicia without interference from a second fluorescing signal emitted by the second indicia.

30. The method of Claim 29 wherein the layer is in the form of a sheet.

31. The method of Claim 29 wherein the layer is in the form of a roll.